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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,848	02/09/2004	Haixin Yang	EL0542USNA	1063

23906 7590 04/06/2006

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WILMINGTON, DE 19805

EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Ch

Office Action Summary	Application No. 10/775,848	Applicant(s) YANG, HAIXIN	
	Examiner Callie E. Shosho	Art Unit 1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/24/04 & 6/30/05</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1 and 5-15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 10/775,785. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following explanation.

The present claims and the copending claims are identical with the exception that the present claims are drawn to method for the deposition of an ink jet printable composition to a substrate comprising depositing an ink composition on a substrate by ink jet printing wherein the ink and substrate are subjected to firing while the copending claims are drawn to ink jet printable composition. While the present claims are drawn to process of using a composition and the copending claims are drawn to a composition, it is noted that the copending claims disclose composition identical to that presently claimed.

Thus, the difference between copending 10/775,785 and the present claimed invention is the requirement in the present claims of method for the deposition of an ink jet printable composition to a substrate comprising depositing an ink composition on a substrate by ink jet printing wherein the ink and substrate are subjected to firing.

On the one hand, although there is no disclosure in the copending claims of method as presently claimed, given that the copending claims are drawn to "ink jet printable" composition, it would have been obvious to one of ordinary skill in the art to print such composition using

method comprising ink jet printing. That is, it would have been obvious to one of ordinary skill in the art that an “ink jet printable” composition would be printed using method comprising depositing the composition onto a substrate using “ink jet printing” in order to quickly and effectively print the ink in order to form an image, and thus one of ordinary skill in the art would have arrived at the present invention from the copending one.

On the other hand, applicant’s attention is drawn to MPEP 804 where it is disclosed that “the specification can always be used as a dictionary to learn the meaning of a term in a patent claim.” *In re Boylan*, 392 F.2d 1017, 157 USPQ 370 (CCPA 1968). Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in an application defines an obvious variation of an invention claimed in the patent. (underlining added by examiner for emphasis) *In re Vogel*, 422 F.2d 438, 164 USPQ 619, 622 (CCPA 1970).

Consistent with the above underlined portion of the MPEP citation, attention is drawn to page 10, lines 18-27 of copending 10/775,785 which discloses method for the deposition of an ink jet printable composition to a substrate comprising depositing the composition on a substrate by ink jet printing.

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use method comprising depositing an ink composition on a substrate by ink jet printing in order to form a printed image, and thereby arrive at the claimed invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 1 recites “functional material”. The scope of the claim is confusing because it is not clear what is meant by “functional material” or what types of materials are encompassed by this phrase. Clarification is requested.

(b) Claim 8 recites an improper Markush group. In line 2, after “group”, it is advised that “comprising” is deleted and replaced with “consisting of”.

Similar suggestion made in claim 10 which also recites improper Markush group.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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6. Claims 1, 4-7, 11-13, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirai (U.S. 2003/0146019).

Hirai disclose method of printing ink jet ink onto substrate comprising depositing the ink onto the substrate by ink jet printing wherein the ink comprises 1-50% conductive functional material such as gold, silver, copper, cobalt, etc., solvent such as alcohol, and polyvinyl pyrrolidone dispersed in the solvent. The polyvinyl pyrrolidone is present in amount of 0.1-2 times the amount of functional material. It is disclosed that the ink possesses viscosity of 1-20 cP. The substrate includes glass or plastic substrate (paragraphs 15-16, 26-27, 31, 35, 47-49, 53, 75-76, and 84). Attention is drawn to example 6 that discloses ink jet ink comprising 12% copper particles, polyvinyl pyrrolidone, and methanol solvent wherein the ink has viscosity of 10.5 cP. It is disclosed that the weight ratio of polyvinyl pyrrolidone to copper is 0.35 and thus, it is calculated that the amount of polyvinyl pyrrolidone present is approximately 4.2%. Although there is no explicit disclosure of the amount of solvent utilized, given that the polyvinyl pyrrolidone is present in amount of 4.2% and the copper present in amount of 12%, it is calculated that the solvent is present in amount of approximately 84%.

In light of the above, it is clear that Hirai anticipate the present claims.

7. Claims 1-2, 4-8, 11-13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 19846096.

DE 19846096, an English translation of which was provided by applicants, discloses method of printing ink jet ink onto substrate comprising depositing the ink onto the substrate by ink jet printing followed by firing the ink and the substrate wherein the ink comprises 10-99%

solvent comprising water and/or organic solvent such as alcohol, ethylene glycol, etc., 0.05-80%, preferably 0.5-20%, conductive functional material that is metal oxide, and 0.1-20%, based on the amount of metal oxide, of at least one dispersant such as polyvinyl pyrrolidone and acrylic resin that is dispersed in the solvent. It is disclosed that the ink possesses viscosity less than 20 mPas. The substrate includes glass or plastic substrate (page 2, lines 1-2, page 2, line 15-page 3, lines 9, page 3, line 26-page 4, line 1, page 5, line 7, page 6, lines 1-6, page 7, line 16-page 9, line 15, page 10, lines 5 and 13-26, page 12, lines 18-20 and example 6).

In light of the above, it is clear that DE 19846096 anticipates the present claims.

8. Claims 1-8 and 11-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Kodas et al. (U.S. 2003/0175411).

Kodas et al. disclose method of printing ink jet ink onto substrate comprising depositing the ink onto the substrate by ink jet printing followed by firing the ink and the substrate wherein the ink comprises 5-50% conductive metal oxide or metal resinate such as silver neodecanoate, solvent such as alcohol or terpene, acrylic resin, photoinitiator, and not greater than 10% polyvinyl pyrrolidone. It is disclosed that the ink possesses viscosity of 10-40 cP. The substrate includes glass substrate and it is further disclosed that the substrate is treated to modify its surface tension. Given that the solvent functions as the ink vehicle, it is clear that the solvent is inherently present in amount as presently claimed. Further, given that all the ingredients are mixed together to form the ink, it is clear that the polyvinyl pyrrolidone is dispersed in the solvent (paragraphs 3, 19, 22-27, 30, 78, 80, 117, 126-127, 131, 135, 141, 143, 283, 295-297, 325-326, 348-349, 354, and 365).

In light of the above, it is clear that Kudas et al. anticipate the present claims.

9. Claims 1, 4-6, 8-9, and 11-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Tucker et al. (U.S. 203/0119943).

Tucker et al. disclose method of printing ink jet ink onto substrate comprising depositing the ink onto the substrate by ink jet printing wherein the ink comprises 84-94% solvent comprising water or organic solvent such as alcohol, 5-10% of one or more binders made from vinyl pyrrolidone or (meth)acrylic or (meth)acrylic dispersed in the solvent, 0.5-5% colorant, i.e. functional material, 0.5-2% crosslinker that is curable monomer, and photoinitiator. It is disclosed that the ink possesses viscosity of less than 50 cP. The substrate includes plastic substrate (paragraphs 2, 6, 8, 10, 25, 33, 41, 45, 50, 54, 86, 92, 99, 103, and 106).

In light of the above, it is clear that Tucker et al. anticipate the present claims.

10. Claims 1, 4-6, 9-12, and 14-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Noguchi et al. (U.S. 5,798,397).

Noguchi et al. disclose method of depositing ink jet printable composition onto substrate comprising depositing the ink jet printable composition onto the substrate by ink jet printing wherein the ink jet printable composition comprises solvent comprising water and/or organic solvent such as alcohol or ethylene glycol ethers, initiator, polymerizable monomer such as pentaerythritol tri(meth)acrylate, 5-50% polyvinyl pyrrolidone dispersed in the solvent, and 3-30% titanium oxide, i.e. functional material. It is disclosed that the composition possesses viscosity of 50 cP or less. The substrate includes glass substrate. Attention is drawn to example 9

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that discloses the use of 50% solvent (col.1, lines 11-18, col.4, lines 15-25, col.17, line 18, col.18, lines 37-39, col.19, lines 23-24, 26-40, and 49-50, and col.19, line 66-col.20, line 10).

In light of the above, it is clear that Noguchi et al. anticipate the present claims.

11. Claims 1, 4-8, and 11-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Loria et al. (U.S. 5,443,628).

Loria et al. disclose method of printing ink jet ink onto substrate comprising depositing the ink onto the substrate by ink jet printing wherein the ink comprises 70-90% water, cosolvent such as alcohol, 0.2-5% resins including polyvinyl pyrrolidone and acrylic resin dispersed in the water/solvent, and 0.2-2% conductivity agent; i.e. functional material. It is disclosed that the composition possesses viscosity of 1-10 cP. The substrate includes glass substrate (col.1, lines 4-8, col.2, lines 24-025, col.4, lines 3-18 and 30, col.4, line 60-col.5, line 12, col.6, lines 11-26, and col.10, lines 24-29).

In light of the above, it is clear that Loria et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
13. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai (U.S. 2003/0146019) or Loria et al. (U.S. 5,443,628) either of which in view of EP 1223201.

The disclosures with respect to Hirai and Loria et al. in paragraphs 6 and 11 above are incorporated here by reference.

The difference between Hirai or Loria et al. and the present claimed invention is the requirement in the claim of firing the ink and substrate.

EP 1223201, which is drawn to ink jet ink, disclose firing the ink and substrate after printing in order to fuse the ink to the substrate (paragraph 51).

In light of the motivation for firing the ink and substrate disclosed by EP 122301 as described above, it therefore would have been obvious to one of ordinary skill in the art to fire the ink and substrate in the process of Hirai or Loria et al. in order to adhere the ink firmly to substrate, and thereby arrive at the claimed invention.

14. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai (U.S. 2003/0146019), DE 19846096, or Loria et al. (U.S. 5,443,628) any of which in view of either Grant et al. (U.S. 6,555,205) or Kodas et al. (U.S. 2003/0175411).

The disclosures with respect to Hirai, DE 19846096, and Loria et al. in paragraphs 6-7 and 11 above are incorporated here by reference.

The difference between Hirai, DE 19846096, or Loria et al. and the present claimed invention is the requirement in the claim of treating the substrate in order to change its surface tension.

Grant et al., which is drawn to ink jet method, disclose pretreating substrate with surfactant in order to lower surface tension and thus reduce spreading of composition on substrate and enhance adhesion of coating to substrate (col.3, lines 50-58).

Alternatively, Kudas et al., which is drawn to ink jet method, disclose surface modification of substrate to increase adhesion and/or control spreading of composition printed thereon through modification of surface tension (paragraph 365).

In light of the motivation for treating substrate to modify surface tension disclosed by Grant et al. or Kudas et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to treat the substrate of Hirai, DE 19846096, or Loria et al. in order to change the surface tension of the substrate and thus, increase adhesion of the ink to the substrate and control spreading of the ink on the substrate, and thereby arrive at the claimed invention.

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirai (U.S. 2003/0146019) in view of Zhu et al. (U.S. 6,251,175).

The disclosure with respect to Hirai in paragraph 6 above is incorporated here by reference.

The difference between Hirai and the present claimed invention is the requirement in the claim of poly(meth)acrylate.

Hirai disclose that the ink comprises binder (paragraph 31).

Zhu et al., which is drawn to ink jet inks, disclose the use of binder that is acrylic resin in order to produce ink with rapid dry time (col.4, lines 9-13 and col.5, lines 29-31 and 53).

In light of the motivation for using acrylic resin disclosed by Zhu et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use acrylic resin in the ink of Hirai et al. in order to produce ink with rapid dry time, and thereby arrive at the claimed invention.

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tucker et al. (U.S. 2003/0119943) in view of Adkins et al. (U.S. 6,379,444).

The disclosure with respect to Tucker et al. in paragraph 9 above is incorporated here by reference.

The difference between Tucker et al. and the present claimed invention is the requirement in the claim of specific type of monomer.

Adkins et al., which is drawn to ink jet ink, disclose the use of trimethylolpropane tri(meth)acrylate in order to enhance curability of the ink. Further, Adkins et al. disclose the equivalence and interchangeability of using of trimethylolpropane tri(meth)acrylate, as presently claimed, with using ethylene glycol diacrylates, as disclosed by Tucker et al. (co.10, lines 29-64).

In light of the disclosure in Adkins et al. of the equivalence and interchangeability of using of trimethylolpropane tri(meth)acrylate monomer with using ethylene glycol diacrylate

monomer in ink jet ink, it therefore would have been obvious to one of ordinary skill in the art to use of trimethylolpropane tri(meth)acrylate in the ink of Tucker et al., and thereby arrive at the claimed invention.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Woudenberg (U.S. 6,896,937) discloses radiation curable ink comprising polyvinyl pyrrolidone, polymerizable monomer, functional material, and photoinitiator, however, there is no disclosure of solvent as required in all the present claims.

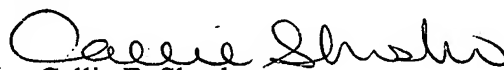
Zhu (U.S. 5,889,083) discloses ink jet ink comprising functional material and polyvinyl pyrrolidone dispersed in solvent wherein the ink comprises viscosity of 1.6-7 cP.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
4/2/06